

FORM PTO-1449	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTY. DOCKET NO. IMEC182.001C1C1	APPLICATION NO. Unknown 10/731,656
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (USE SEVERAL SHEETS IF NECESSARY)		APPLICANT Satta et al.	
		FILING DATE Herewith	GROUP Unknown

U.S. PATENT DOCUMENTS							
EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE (IF APPROPRIATE)
<i>DN</i>	1.	4,058,430	11/15/77	Suntola et al.			
	2.	4,413,022	11/1/83	Suntola et al.			
	3.	4,747,367	5/31/88	Posa			
	4.	4,761,269	8/2/88	Conger et al.			
	5.	5,674,781	10/7/97	Huang et al.	437	192	2/28/96
	6.	5,711,811	1/27/98	Suntola et al.			
	7.	5,879,459	3/9/99	Gadgil et al.			
	8.	5,904,565	5/18/99	Nguyen et al.			
	9.	5,916,365	6/29/99	Sherman			
	10.	5,933,761	8/3/99	Lee	438	783	7/10/98
	11.	6,048,790	4/01/00	Lacoponi et al.	438	643	7/10/98
	12.	6,077,775	6/20/00	Stumborg et al.			
	13.	6,083,818	7/4/00	Stumborg et al.			
	14.	6,093,683	7/25/00	Cho et al.	438	627	12/10/98
	15.	6,100,184	8/8/99	Zhao et al.			
	16.	6,139,700	10/31/00	Kang et al.	204	192.17	9/30/98
	17.	6,184,128 B1	2/6/01	Wang et al.			
	18.	6,188,134 B1	2/13/01	Stumborg et al.	257	751	8/20/98
	19.	6,200,639 B1	3/13/01	Batra et al.			
	20.	6,200,893	03/2001	Sneh			
	21.	6,200,893 B1	3/13/01	Wang et al.	438	685	3/13/01
	22.	6,203,613 B1	3/20/01	Gates et al.			
	23.	6,207,567 B1	3/27/01	Wang et al.	438	685	4/12/99
	24.	6,225,213 B1	5/1/01	Urabe	438	627	1/22/98
	25.	6,270,572 B1	8/7/01	Kim et al.			
	26.	6,287,965	9/11/01	Yokoyama et al.	438	624	4/23/98
<i>DN</i>	27.	6,358,829	3/18/02	Yoon et al.			9/16/99

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U.S. PATENT DOCUMENTS							
EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE (IF APPROPRIATE)
<i>di</i>	28.	6,368,954	4/9/02	Lopatin et al.	438	627	7/28/00
	29.	6,391,785	05/2000	Satta et al.			
<i>di</i>	30.	2001034123 (US published application 2001)	10/25/01	Jeon et al.	438	643	4/6/01

FOREIGN PATENT DOCUMENTS								
EXAMINER INITIAL		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
							YES	NO
<i>di</i>	31.	DE 196 27 017 A1	1/9/97	Germany				
	32.	DE 198 20 147 A1	1/7/99	Germany				
	33.	KR 2000054970	2/2/99	Korea				
	34.	WO 96/17107	6/6/96	PCT				
<i>di</i>	35.	WO 99/41423	8/19/99	PCT				

EXAMINER INITIAL	OTHER DOCUMENTS (INCLUDING AUTHOR, TITLE, DATE, PERTINENT PAGES, ETC.)	
<i>di</i>	36.	Abeles et al., "Amorphous Semiconductor Superlattices," <u>Physical Review Letters</u> , November 1983, Vol. 51, No. 21, pp. 2003-2006.
	37.	Bedair, S.M., "Selective-area and sidewall growth by atomic layer epitaxy," <u>Semicond. Sci. Technol.</u> , Vol. 8, (1993), pp. 1052-1062.
	38.	Döscö et al., Research Institute for Materials Science - ATKI, H-1525 Budapest, Hungary; Utriainen et al., Laboratory of Inorganic and Analytical Chemistry, Helsinki University of Technology, FIN-02150 Espoo, Finland, "Deposition of Tin Oxide into Porous Silicon by Atomic Layer Epitaxy," <u>J. Electrochem. Soc.</u> , February 1996, Vol. 143, No. 2, pp. 683-687.
	39.	Fazan et al., "A High-C Capacitor (20.4 fF/ μm^2) with Ultrathin CVD - Ta ₂ O ₅ Films Deposited on Rugged Poly-Si for High Density DRAMs," <u>IEEE</u> , 1992, pp. IDEM 92-263-IDE M 92-268.
	40.	George et al. "Atomic layer deposition of tungsten on oxide surfaces" <u>Book of Abstracts, 219th ACS Nat'l Meeting, SF, CA</u> March 26-30 2000 published by American Chemical Society, Washington D.C.
	41.	Hiltunen et al., "Nitrides of Titanium, Niobium, Tantalum and Molybdenum grown as Thin Films by the Atomic Layer Epitaxy Method," <u>Thin Solid Films</u> , 1988, Vol. 166, pp. 149-154.
	42.	Horike et al., "Filling of Si oxide into a deep trench using digital CVD method," <u>Applied Surface Science</u> , 1990, Vol. 46, pp. 168-174.
	43.	Kaizuka et al., "Conformal Chemical Vapor Deposition TiN (111) Film Formation as an Underlayer of Al for Highly Reliable Interconnects," <u>Jpn. J. Appl. Phys.</u> , 1994, Vol. 33, pp. 470-474.
	44.	Kikkawa et al., "A Quarter-Micrometer Interconnection Technology Using a TiN/Al-Si-Cu/TiN/Al-Si-Cu/TiN/Ti Multilayer Structure," <u>IEEE Transaction on Electron Devices</u> , February 1993, Vol. 40, No. 2, pp. 296-302.
	45.	Kikkawa et al., "Al-Si-Cu/TiN multilayer interconnection and Al-Ge reflow sputtering technologies for quarter-micron devices," <u>SPIE</u> , 1992, Vol. 1805, pp. 54-64.
	46.	Kim et al., "Applicability of ALE TiN films as Cu/Si diffusion barriers" <u>Thin Solid Films</u> 372(1):276-283 (2000)
	47.	Kim et al., "Comparison of TiN and TiAlN as a Diffusion Barrier Deposited by Atomic Layer Deposition" <u>Journal of the Korean Physical Society</u> , 40(1), 176-179 (2002)
<i>di</i>	48.	Klaus et al., "Atomic Layer Deposition of SiO ₂ Using Catalyzed and Uncatalyzed Self-Limiting Surface Reactions," <u>Surface Review and Letters</u> , Vol. 6, Nos. 3 & 4 (1999) pp. 435-448.

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EXAMINER INITIAL	OTHER DOCUMENTS (INCLUDING AUTHOR, TITLE, DATE, PERTINENT PAGES, ETC.)	
<i>BN</i>	49.	Klaus et al., "Atomic Layer Deposition of Tungsten Nitride Films Using Sequential Surface Reactions" <u>J. Electrochem Soc.</u> 147(3): 1175-1181 (2000)
	50.	Klaus et al., "Atomically controlled growth of tungsten and tungsten nitride using sequential surface reactions," <u>Applied Surface Science</u> , Vols. 162-163, pp. 479-491 (2000).
	51.	Koo et al., "Study on the characteristics of TiAlN thin film deposited by atomic layer deposition method" <u>Journal of Vacuum Science & Technology, A: Vacuum Surfaces, and Films</u> 19(6), 2931-2834 (2001)
	52.	Kukil et al., "Atomic Layer Epitaxy Growth of Tantalum Oxide Thin Films from Ta(OC ₂ H ₅) ₅ and H ₂ O," <u>J. Electrochem. Soc.</u> , May 1995, Vol. 142, No. 5, pp. 1670-1674.
	53.	Leskelä et al., "Atomic Layer Epitaxy in Deposition of Various Oxide and Nitride Thin Films," <u>Journal De Physique IV, Colloque C5, supplément au Journal de Physique II</u> , June 1995, Vol. 5, pp. C5-937-C5-951.
	54.	Martensson et al., "Atomic Layer Epitaxy of Copper on Tantalum," <u>Chemical Vapor Deposition</u> , Vol. 3, No. 1, pp. 45-50 (1997).
	55.	Martensson et al., "Atomic Layer Epitaxy of Copper, Growth and Selectivity in the Cu(II)-2,2,6, 6-tetramethyl-3, 5-heptanedionate/H ₂ Process," <u>J. Electrochem. Soc.</u> , Vol. 145, No. 8, August 1998, pp. 2926-2931.
	56.	Martensson et al., "Use of atomic layer epitaxy for fabrication of Si/TiN/Cu structures," <u>J. Vac. Sci. Technol. B</u> , September/October 1999, Vol. B 17, No. 5, pp. 2122-2128.
	57.	Min et al., "Atomic Layer Deposition of TiN Films by Alternate Supply of Tetrakis (ethylmethylamino)-Titanium and Ammonia," <u>Japanese Journal of Applied Physics</u> , 1998, Vol. 37, pp. 4999-5004.
	58.	Min et al., "Atomic Layer Deposition of TiN Films by Sequential Introduction of Ti Precursor and NH ₃ ," <u>Materials Research Society</u> , 1998, Vol. 514, pp. 337-343
	59.	Min et al., "Chemical Vapor Deposition of Ti-Si-N Films with Alternating Source Supply," <u>Mat. Res. Soc. Symp. Proc.</u> , 1999 Materials Research Society, Vol. 564, pp. 207-210.
	60.	Min et al., "Metal-organic atomic-layer deposition of titanium-silicon-nitride films," <u>Applied Physics Letters</u> , Vol. 75, No. 11 pp. 1532-1523 (1999).
	61.	Niinistö et al., "Synthesis of oxide thin films and overlayers by atomic layer epitaxy for advanced applications," <u>Materials Science and Engineering</u> , 1998, Vol. B41, pp. 23-29.
	62.	Ritala et al., "Atomic Layer Epitaxy Growth of TiN Thin Films from TiI ₄ and NH ₃ ," <u>J. Electrochem. Soc.</u> , August 1998, Vol. 145, No. 8, pp. 2914-2920.
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	66.	Sakaue et al., "Digital Chemical Vapor Deposition of SiO ₂ Using a Repetitive Reaction of Triethylsilane/Hydrogen and Oxidation," <u>Japanese Journal of Applied Physics</u> , January 1990, Vol. 30, No. 1B, pp. L124-L127.
	67.	Sneh et al., "Atomic layer growth of SiO ₂ on Si (100) using SiCl ₄ and H ₂ O in a binary reaction sequence," <u>Surface Science</u> , 1995, Vol. 334, pp. 135-152.
	68.	Solanki et al., "Atomic Layer Deposition of Copper Seed Layers" <u>Electrochem. and Solid State Lett.</u> 3(10): 479-480 (2000)
<i>BN</i>	69.	Wise et al., "Diethyldioxyasilane as a New Precursor for SiO ₂ Growth on Silicon," <u>Mat. Res. Soc. Symp. Proc.</u> , 1994, Vol. 334, pp. 37-43.

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